

The New Look of Indo-European Reconstruction and Typology*

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Indo-European is one of the most recent languages to appear on the face of the earth. No wonder that it still has growing pains and teething troubles, that it still has not reached the final fulfillment of its entelekheia. It was discovered exactly 150 years ago by a young German scholar, *Franz Bopp*, not, as one might have expected, in some unknown part of the world, but in his study. One might almost say that the paleness, and haziness, and lack of colour, which are so characteristic of the appearance of IE at this early stage of its development, are the consequence of this curious circumstance that it was born in a study, not in the wide open spaces.

For the IE language, found, or invented, by *Bopp* strangely enough was not possessed of any clearly recognizable features. Nowadays the description of any language would start with its sounds, with its phonological system. *Bopp* omitted this. He devoted all his energy to the study of morphology, but not in the sense that he set about describing it: he aimed at much more, he wanted to reveal the origins of this morphology. This mistake in method – if we judge him from our present vantage point – was again closely bound up with, and predetermined by, the circumstances of the birth of the new language. It was due to the fact that, shortly before, the Sanskrit language had become known. The clarity of its grammatical structure was so impressive that it was tempting to concentrate on the problems posed by this structure, especially on the problem of its origin. Phonology was therefore neglected. More

exactly, since the Sanskrit language seemed so archaic in all its aspects, so close to what the 'original state of affairs' must have been, it was assumed without further ado that its phonological system, too, was nearest to that of the 'original' language, nay was identical with it. No one could be expected at that time to ask the question whether this was likely, or possible at all.

The omission of the pioneers was amply made good by the next generation. The seventies, in which the most important discoveries in historical phonology followed one another with breath-taking rapidity, can truly be regarded as the glorious decade of IE, and generally of historical linguistics. Thus a more balanced picture of phonology and morphology was obtained. Before the century was out, considerable achievements in syntax rounded out this picture.

This first period of Indo-European, and General Linguistics – roughly the 19th century – can be rightly described as the period of German ascendancy. Its coping stone was *Brugmann's Grundriss*; the second edition of its volume II, though published 1906–1916, brought nothing new either in material or in outlook.

The second period of modern linguistics, which I should at present take down to the outbreak of the Second World War, may be described as the era of French ascendancy. This does not mean that we can ignore the great German contributions to linguistic science in the early 20th century: the opening up of new disciplines such as Hittitology – after the initial steps of Hrozný – and Tokharian philology, the wonderful revival of Iranian studies will always remain a glorious German chapter in the annals of scholarship. But it cannot be denied that during this period Paris becomes ever more the uncontested leader in this field. The new ideas in the IE field, pointing the way to future developments, come from *Meillet*. In the thirties also from his pupils, e. g. *Kurylowicz* and *Benveniste*. We must add to this the renaissance of general linguistic studies, again initiated by *Meillet* (in a sociological direction). Though soon to be overshadowed by *de Saussure* and his Geneva school. *Meillet* was instrumental in spreading the new ideas of the master of his youth, and one can also say that the ideas of the Prague school, fertilized, perhaps even triggered off, by *Saussure's Cours*, reached the world through the French school.

In the first half of this period, IE linguistics, and quite generally genetic linguistics, maintained its leading position. But this changed after the First World War. From then on the influence of

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Saussurean thought was on the increase, in the thirties largely under the glorious sign of phonology. In this last decade we can already notice the emergence of the new school which was to inherit the role of leader in the next period. For, although since the last war linguistic studies have blossomed everywhere – and special mention should be made here of the smaller nations of Central Europe – there is nevertheless no denying that the two decades from 1945 to 1965 must be called the period of American, or perhaps Anglo-Saxon, ascendancy in our field, too. I should not care to predict whether the next decade will, at its end, appear to belong to this period or to have ushered in a new ascendancy, possibly of Soviet linguistics.

During these three periods, IE studies have experienced various turns. Their supremacy was uncontested in the first period. In the second they began to fall under a shadow. The third has seen a miraculous revival, perhaps even more impressive in their adoptive country, America, than on this side of the Atlantic.

The eclipse which I have referred to was caused, in Europe at any rate, by an unfortunate, almost fatal, dictum of *de Saussure's* who insisted on a strict separation of synchronic and diachronic studies, and in the process nearly killed the passionate love of his youth. The miraculous revival, on the other hand, has been due to the fact that in the late thirties the ban on diachronic studies began to be recognized as erroneous and futile. What is more, a new generation which had grown up on the new methods and principles of structuralism and functionalism, naturally felt called upon to re-examine the problems of the old science in the light of the principles of the new. It also had great protagonists to look up to: *Roman Jakobson* who could never bring himself to accept *Saussure's* dichotomy, and *André Martinet* whose *Economie*, both in the treatment of first principles and in their application to case histories, has been of prime importance for the revival of historical studies. On this occasion I should like to show how this fruitful cooperation can be brought to bear upon the problems of IE phonology.

I.

We may, perhaps, make a start with IE vocalism. The essence of the problem will become clear from a rapid survey of the several stages traversed since the inception of IE studies.

(1) Far into the sixties it was held that the IE vocalism was

most faithfully preserved in Sanskrit. Therefore the vowels *a – i – u*, with the corresponding long ones, were posited for IE, e. g. in *Schleicher's Compendium*.

(2) In 1864 *G. Curtius* pointed out that in many cases all European languages presented *e* as against *a* in Aryan, and concluded that these languages could not have all innovated independently. But persuaded of the primacy of Sanskrit, he was prepared to admit that the European languages, in unity, split an original *a* into *e* and *a*; some later went even further and split the remaining stock of *a* into *a* and *o*.

(3) Since no reason could be found for this two- or three-way split of an original *a*, the view was gaining ground in the seventies that the diversity of the South European languages was more archaic than the uniformity of Sanskrit. The final proof came in 1876¹ with the discovery of the Aryan palatalization law which showed that at one time Sanskrit, too, possessed *e*. Thus the priority of the vocalism of Greek, Latin, etc., over that of Sanskrit was firmly established: IE now was seen to have had *a e o i u* in its system.

(4) Hardly had IE vocalism acquired its new look, when it was attacked from a new angle. Comparing various root-structures, the young *de Saussure* suggested in late 1878 (*Mémoire* 135) that IE had only one vowel, *e*, which could subsequently be modified by two coefficients, *A* and *O*, to *ē/ā* and *ō* respectively; on their own, *A* and *O* gave short *a* and *o* respectively (e. g. *agō* 'I lead' from *Ag-*).

(5) This construct has two weak points at least. First, *Saussure* cannot explain how the same proto-form, *eA*, can give *ē* but also *ā*. Secondly, if *es-* 'be', *ed-* 'eat', etc., show the normal degree of the root, it is incomprehensible how *ag-* 'lead', *od-* 'smell' can show the nil-grade as assumed by *Saussure*. Both weaknesses were at once noticed by *H. Møller* who between 1880 and 1917 built up a new system. *Møller* pointed out that the three vowel-timbres demanded

¹ From *Osthoff's* report (*Die neueste Sprachforschung*, 1886, 14f.) it is clear that, visiting in Leipzig at the beginning of the winter-semester 1876/77, *Verner* informed *Osthoff* of his discovery, and through *Osthoff* it became known to others in Leipzig, especially *Brugmann*, *Hübschmann*, *Leskien*, and *de Saussure*. Early in 1877, *Osthoff* visited *J. Schmidt* who was surprised when told of *Verner's* discovery; at KZ 25, 1881, 63, he says that he expounded the law in his teaching from May 1877 on. *Osthoff* also mentions (19; cf. also *Collitz*, BB 11, 1886, 203¹) that the law was discovered, independently from *Verner*, by *Tegnér* in Lund, and *Thomsen* in Copenhagen. My note at *Lingua* 13, 1964, 4*, is to be completed accordingly. *Porzig's* assertion (*Gliederung des idg. Sprachgebiets*, 1954, 27) that the law was discovered by *Collitz* in 1879 is erroneous in both parts.

three coefficients ($eH_1 = \bar{e}$, $eH_2 = \bar{a}$, $eH_3 = \bar{o}$)², and the structural identity of, e. g., *es-* and *ag-*, *od-* demanded that *ag-* be interpreted as *H₂eg-*, *od-* as *H₃ed-*, and even *es-* is to be viewed as *H₁es-*.

(6) The views of *Saussure* and *Møller* were for nearly 50 years regarded as pure heresy. Only *Møller's* pupil, *H. Pedersen*, and the French outsider, *A. Cuny*, adhered to them, in general Brugmannian orthodoxy prevailed. This changed, almost overnight, when, in 1927, *Kurylowicz* announced that the laryngeals, thought to have been lost in all IE languages, survived in Hittite to a very large extent. Thus the forms, reconstructed by laryngealists as *H₁es-*, *H₂ent-*, *H₃est-* (Greek *ἐσ-*, *ἐντ-* and *ἐστ-έον*), appear in Hittite as *es-*, *hant-*, *hast-*, i. e. *H₂* and *H₃* survive as *h*, although *H₁* is lost there, too.

This sixth stage, especially in the form in which it is presented in *Benveniste's* *Origines*, can be regarded as today's orthodoxy. The theory has not, of course, remained unchanged through the last 30 odd years. The stock of laryngeals, in particular, has in recent years assumed alarming proportions; instead of three, we are now encouraged to posit 4, 6, 8, even 10 of these undefined, or ill-defined, phonemes³. But all this is peripheral and irrelevant. The main point is, and on this point all shades of laryngealist opinion are agreed, that the Proto-IE vowel-system, if this be the right term, consisted of the single vowel *e*. For we must not forget that, according to these schools, *i* and *u* are not original vowels but simply later developments from the earlier consonantal *y* and *w*.

The problem, which I wished to discuss first, is now quite clear. It can be formulated as follows:

Is the vocalism just reconstructed for Proto-IE correct? Is it possible at all?

Theoretically, the problem can be approached from two different angles.

First, one can, and I should say one must, ask the question whether the reconstruction *qua* reconstruction is acceptable. Essentially, it is based on two observations. First, *o* often alternates with *e*, which leads to the conclusion that *o* is always the result of ablaut, more specifically 'Abtönung', of original *e*. Secondly, *a* is compara-

tively rare, from which it is again concluded that *a* is always suspect of being secondarily developed, and perhaps only in some languages. Moreover, both *o* and *a* can, at least in initial position, be replaced by *e* if we put the appropriate laryngeal in front of it.

I have taken occasion before now to show that, even if by these methods numerous words be reduced to a primitive form with *e* vowel, a sufficiently large group remains whose *a* vowel cannot be eliminated. Words like IE **kaso-* 'grey; hare', **nas-* 'nose', **bhardhā* 'beard', **ghans-* 'goose', **sal-* 'salt', **dakru-* 'tear', have always had *a*, and, if we are not prepared to abandon the time-tested methods of reconstruction, we must reconstruct them with a vowel *a* even today⁴. And if in the case of *a* our evidence conclusively disproves all lighthearted conclusions drawn from the paucity of material, we shall be justified in being sceptical about the argument, hardly tenable in strict logic, that, since most cases of *o* can be shown to represent 'Abtönung' of *e*, all *o* sounds must have the same source. For 'cow' all IE languages present a basic form **g^wou-*⁵. Those who are prepared to trace this to an earlier **g^weu-* cannot claim any evidence for such a procedure, only the urge to reduce all *o*-vowels to an earlier *e*. This remains true even if, by way of a corollary, it is assumed that some *o*-vowels are not due to Abtönung but to an *o*-coloured laryngeal, and in the present case, e. g., **g^weH₃u-* is posited. Similarly, there is not a whit of evidence which would encourage us to trace IE **bhosos* 'naked' (Engl. *bare*, Lith. *basas*, Arm. *bok*, etc.⁶) to an earlier **bhes-*, or **ghostis* 'stranger, guest' (Lat. *hostis*, Goth. *gasts*, etc.) to anything but **ghos-*⁷, and the same applies to such well-attested words as **koksā* (Lat. *coxa*, OIr. *coss* 'foot', etc.), **kos(e)lo-* 'hazel' (Lat. *corulus*, OHG *hasal*, etc.), **polis* 'master'⁸.

If, then, the facts of reconstruction are taken seriously, we cannot but recognize that IE had, at least the vowel triad *a e o*. Similarly, the vowels *i* and *u* undoubtedly existed in IE phonetically,

⁴ See *Lingua* 13, 1964, 8. Note also *Wyatt's* argument, *Lg.* 40, 1964, 150.

⁵ See my discussion at KZ 73, 1956, 186f.

⁶ Now found in Iranian also, see *Sprache* 12, 1967, 215f.

⁷ It is interesting that *Pokorny*, IEW 163, is inclined to derive **bhosos* (after *Kretschmer*) from **bhes-* 'abreiben, abscheuern', although the only real evidence for such a form is provided (o.c., 145) by Skt. *babhasti* 'zerkaut' – hardly suitable semantically – while Skt. *ghas-* 'essen, verzehren', which is close to *bhas-* both in meaning and in form, is traced to **ghos-* (452).

⁸ On this see now *Szemerényi*, *Syncope in Greek and IE*, Naples 1964, 337f.

² Under the influence of his IE-Semitic theories, *Møller* later assumed more than three coefficients, named by him laryngeals. For further references see *Lingua* 13, 1964, 5. —

³ See my *Trends and Tasks in Comparative Philology*, London 1962, 10f.

although it may be maintained that phonemically they were allophones of the phonemes *y* and *w*. But the point of the modern theories is not this. Starting from the observation that *i* and *u* often represent the nil-grade of *ei* and *eu* (or *ye* and *we*), they assume that *i* and *u* always represent the nil-grade of the aforementioned sequences. This is an indefensible inference which, instead of alerting the student to the possibility of earlier variety behind the smooth façade of later uniformity, lulls him into a false sense of security, into thinking that there is no problem left there.

Thus reconstruction as such restores a picture which is essentially the one portrayed by the Brugmannian era. It is a great pleasure to see that *Kurylowicz* who with his early discovery so powerfully contributed to the victory of the one-vowel system has in recent years found reason for embracing more and more of the old doctrine⁹, notwithstanding the furious outbursts on the part of some angry young men who charge that he is getting ever more oldfashioned.

There is no need to go here into the problem of *shwa*¹⁰. Much more interesting and important is the question whether the reconstruction just outlined – a system of several vowels of a well-known type – can be reconciled with the ‘modern’ view which puts in its place, or at least as its antecedent at an earlier chronological level, a ‘system’ in which there is only one vowel. Again, it is of no interest here whether in such a system we can still rightly speak of a vowel, and whether that should be defined as *e*, or *ä*, or in any other form, or whether we should regard the ‘vowel’ as non-phonemic, as a sort of automatic ‘support for the pronunciation of consonants’¹¹, and abandon it altogether, postulating for this early IE ‘syllabophonemes’ instead¹². For at this juncture the question arises whether such a language is possible at all as a natural language. The question cannot be answered on *a priori* grounds, only empirical facts can help us to decide it. In other words, we must ask whether such a linguistic state is found anywhere among the numerous languages of the world. It is no accident that current

⁹ See the references at *Lingua* 13, 1964, 6¹³, and Proceedings of the IXth Congress, 1964, 28.

¹⁰ For a recent discussion, see *Wyatt*, *Lg.* 40, 1964, 138–152.

¹¹ *Borgström*, *NTS* 15, 1949, 138.

¹² *Klyčkov*, *VJ* 1963/5, 5. *Kacnel'son* spoke earlier (*VJ* 1958/3, 54) of a ‘slogovaja fonema’ or ‘protofonema’.

reconstructions fail to face this question. Their method is ahistorical, the result of its application is the pleasure of contemplating the beauty of a mathematical construct, not the intellectual satisfaction of knowing that the reconstruction, even if it should not represent the truth, represents something that could have been the truth because it is not contradicted by experience. It is at this point that recent developments in general linguistics, in particular *typological studies*, can become useful to the genetic linguist.

It was in 1928 that *Trubetzkoy* realized the importance for various reasons of studying the phonological systems, at that time the vocalic systems, of as many languages as possible. During the summer of that year he first set out and compared 34 vowel-systems, by September he got together 46. He found that all could be reduced to a small number of symmetrical types (triangles, parallel series, etc.), and drew an important conclusion: ‘Ich glaube, daß die auf diese Weise gefundenen empirischen Gesetze insbesondere für die Sprachgeschichte und für die Rekonstruktion von großer Bedeutung sein werden... Sie müssen für alle Sprachen anwendbar sein, sowohl für die theoretisch rekonstruierten Ursprachen als auch für die verschiedenen Entwicklungsstadien der historisch belegten Sprachen’¹³.

In 1928 *Trubetzkoy* hoped that in the end he would be able to collect the material of about a hundred languages. In the posthumously published ‘Grundzüge’ the analysis of the vowel-systems is, as we learn from the preface, based on 200 thoroughly evaluated phonological systems. For the classification of the vowel-systems he first uses the criterion of ‘localization’, i. e. the differences between front-, middle- and back-vowels. For our question – whether there are any one-vowel systems – particularly important is his description of those languages, in which the localization properties ‘keine distinktive Kraft besitzen, da sie automatisch durch die Lautumgebung bedingt sind’ (p. 87). In such vowel-systems, called by him linear, differentiation can be achieved by differences of aperture only. According to *Trubetzkoy*, there is no linear system with a single degree of aperture – that would be a one-vowel system – nor with two degrees of aperture. As an example of a linear system with three degrees of aperture he quotes (l. c.) *Adyge* which has a maximally open and maximally close vowel, and between these two

¹³ Letter of 19.9.1928, see *Trubetzkoy*, *Grundzüge der Phonologie*, 1962², 285.

extremes a half-open vowel. All these vowels show variants which, dependent on the environment, are more front or back, and more or less rounded. Besides, the three phonemes differ in duration: the open vowel is long, the close is ultrashort, the half-open is short. A similar situation is found, according to *Trubetzkoy* (p. 88), in Abkhaz, and probably also in Ubykh, but in these the difference between half-open and maximally open seems to be that between *a* and *ā*. The three languages here mentioned all belong to the North-West group of the Caucasian languages¹⁴, or, according to *Deeters*' classification¹⁵, to the Western group.

Concerning the degree of aperture, *Trubetzkoy* states (p. 97) that there are 'keine Vokalsysteme ohne distinktive Öffnungsgrad-gegensätze'. He disproves *van Ginneken's* assumption that in Lak – again a Caucasian language, this time of the North-East, or, according to *Deeters*' classification; of the Eastern group – the degree of aperture is phonologically irrelevant for the three vowel-phonemes, and shows that the vowel-system of Lak is the usual triangle-type (u, a, i).

Thus, if we examine the known vowel-systems of the languages of the world from the typological point of view, we find, according to *Trubetzkoy* (p. 86), that there seems to exist no language with a single vowel. *Hockett* likewise states that 'the one dimension that is always present is that of tongue-height, and attested vowel-systems involve two, three, or four contrasting heights'¹⁶ – that is never less than two heights.

The great importance of these empirical findings for hypothetically reconstructed vowel-systems is self-evident. For, if natural languages never show a one-vowel system, that surely is a strong indication of its being incompatible with the nature of the linguistic code. If such a state is reconstructed for any stage of IE, we can regard it as impossible, or, if we wish to be quite cautious, as utterly unlikely. *Trubetzkoy* drew this consequence in a quite general form (p. 87¹): 'Daher soll man sich hüten, solche Verhältnisse für rekonstruierte Perioden anzunehmen, wie es leider manchmal ge-

schieht'. Strangely enough, this admonition went unheeded for quite a while. Fortunately, greater attention has been paid to it since it was repeated by *R. Jakobson* ten years ago. In his important and fascinating report on 'Typological studies and their contribution to historical comparative linguistics'¹⁷, delivered to the 8th congress of linguists in 1957, *Jakobson* formulated some caveats, based on world-wide typological studies, for reconstruction, in particular for the reconstruction of IE. Emphasizing that 'a conflict between the reconstructed state of a language and the general laws which typology discovers makes the reconstruction questionable', he pointed out that 'the one-vowel picture of Proto-Indo-European finds no support in the recorded languages of the world' (p. 528). *Jakobson's* thesis was attacked in the debate by the Cambridge comparatist, *W. S. Allen*. He drew attention to Abaza, a (North-)West Caucasian language which, according to his findings, had only one vowel¹⁸, i. e. in reality no vowel. But in his summing up, *Jakobson* dismissed this objection with the following words (o. c., 531): 'Despite the venturesome attempts to detect a modern North-Caucasian language without phonemic vowel differences, the attribution of a one-vowel status to Proto-IE still contradicts our phonemic experience.'

But *Jakobson's* statement, or dictum, formulated in his usual pungent manner, was not the last word on the subject. *Allen* has recently repeated his thesis¹⁹ and pointed out that the vocalism of Kabardian had been, independently of him, interpreted in the same way by the Dutch linguist *Aert H. Kuipers*. Assuming that the claim were true, one could still have two kinds of attitude towards it. One could state, with *Jakobson*, as a general principle concerning linguistic universals that 'even if in some remote, newly recorded language we should find a peculiarity challenging one of these laws, this would not invalidate the generalization drawn from the imposing number of languages previously studied. The uniformity observed becomes a "near-uniformity", a rule of high statistical probability'²⁰. In other words, the fact (!) that, as against the

¹⁴ See, e.g., *Dumézil*, in: *Les langues du monde* (ed. *Meillet-Cohen*), 1952¹, 231f.

¹⁵ *Deeters*, *Die kaukasischen Sprachen* (Handbuch der Orientalistik I/7, 1963, 1–79), 8f.; also *G. A. Klinov*, *Kavkazskije jazyki*, Moscow 1965, 14f.

¹⁶ *Hockett*, *A manual of phonology*, 1955, 83. See also *Malmberg*, *Structural linguistics and human communication*, 1963, 49 (with fn. 1). 126, but especially 172: 'Certain solid distinctions (within the vowel systems the extreme values i–u–a) have to be looked upon as basic in the sense that all languages have at least those oppositions.'

¹⁷ Now reprinted in his *Selected Writings I*, 1962, 523–532.

¹⁸ *Proceedings of the 8th Congress* (1957), 1958, 28.

¹⁹ *Lingua* 13, 1965, 111–124: On one-vowel systems.

²⁰ See *Selected Writings I* 526. Cf. also the formulation (at: *Universals of Language*, ed. *J. H. Greenberg*, 1963, 212): 'Statistical uniformities with a probability slightly less than one are no less significant than uniformities with probability of one.'

general pattern observed in all the languages of the world studied so far, one or two or even half-a-dozen exhibit a deviant, abnormal pattern will not be regarded as sufficient justification for admitting the deviant pattern as a support for a reconstruction of the deviant type. Statistical probability should still be given due weight. It is an easy but cheap jibe to quote the apparently profound dictum: 'as if one dark Dane would not invalidate the proposition that all Danes have fair hair'²¹; it is pretty certain that those who adhered to the general proposition would not be disturbed by the appearance of a dark Dane – they would simply regard him as a fraud who tries to pass himself off as a Dane, in spite of appearances²².

The alternative to this attitude would be to say that, since typology does not provide us with the hoped-for universal, it has failed us in our quest of support for our task. As historical linguists we must then fall back on our own methods of reconstruction, and if these methods clash with the current picture of IE vocalism, we can reject the latter – but only on the strength of our own methods.

I personally should be quite ready to let the case against the current view rest on the evidence of reconstruction. But before doing so it is worth looking at the evidence quoted for the view that some languages do have a one-vowel system.

As we have seen above, the most recent example of such a language is said to be Kabardian whose phonemic system has recently been analyzed by *A. H. Kuipers*²³. Kabardian is the Eastern branch of Adyge, the North-West Caucasian language mentioned above as having, according to *Trubetzkoy's* analysis, a linear vowel system with three degrees of aperture. With this analysis *Trubetzkoy* contradicted *Yakovlev's* proposal to regard the Kabardian vowel-system as consisting of two short vowels – one open, one close – and one long vowel. *Kuipers* argues (32 f.) that *Trubetzkoy* went wrong in taking the three vowels to form a linear system, especially by ignoring the difference in quantity and, in some environments at least, the lack of difference in openness between his two lower vowels. He therefore returns to *Yakovlev's* system, but only to propose an important reinterpretation. For, in *Kuiper's* view, 'there are a

number of indications that *ā* in syllable-initial represents a sequence *ha*, and in other positions a sequence *ah'* (33). Thus the previous three-vowel system is now reduced to two vowels: the high vowel *ə* and the low vowel *a*. *Kuipers* then goes on to argue (40 f.) that *ʔ* is not really a phoneme: 'considering *ə* a separate phoneme leads to serious complications in the description of the morphology, necessitates arbitrary decisions with regard to morpheme borders, does not allow a clear separation of the phonological and morphological levels, and leads to unclegant (!) rules in accounting for the most simple facts of the language. These difficulties are eliminated by regarding sequences of a consonant plus a short high vowel as unit phonemes which have vowelless implosive variants' (49). Thus *ə* becomes a stress and juncture phenomenon, and we would seem to be left with *a* as the only vocalic phoneme. But *Kuipers* then goes on to eliminate even this phoneme (50 f.), and the final result of his analysis is (104) that: 'The most striking characteristic of the Kabardian phonemic system is the absence of an opposition consonant-vowel'²⁴.

This final result is, I think, worth stressing: Kabardian, as analyzed by *Kuipers*, shows not a one-vowel system but the complete absence of vowels. In these circumstances it is difficult to see – in spite of *Kuipers's* efforts to see parallels (105) – how the Kabardian system could be relevant to the study of IE, except at the hypothetical (Proto-Proto-IE) stage where there were only open syllables with consonant + inherent vocoid²⁵. For our reconstructed IE the sequence *p-r-k*, for instance, can still be two different things, either *perk* or *prek*, and there is no way of predicting the position of the vowel, the vocoid is phonemic.

But of much greater interest is the question whether *Kuipers's* analysis of Kabardian will stand up to closer scrutiny. Surprisingly enough, the one Caucasian linguist who has both the specialist knowledge of the linguistic group and the theoretical equipment, has failed to give us a critical appraisal of *Kuipers's* work. He contents himself with saying: 'The Kabardian data are complex, and there may well be room for argument about certain features of *Kuipers's*

²¹ *Allen*, *Lingua* 13, 1964, 115.

²² It would have been better to quote *Jakobson's* example of the duckbilled platypus (*Selected Writings* I 526) – although even this would not tell against the general principle of statistical (im)probability.

²³ *Aert H. Kuipers*, *Phoneme and morpheme in Kabardian*, The Hague 1960.

²⁴ Cf. also *Allen's* summary, *Lingua* 13, 1964, 113–115, who stops at the one-vowel stage, which is what is important for his argument; note, however, his speculations at p. 123.

²⁵ See *Borgström's*, *Klyčkov's*, and *Kacnel'son's* views quoted at fnn. 11–12, and cp. *Pedersen*, *The discovery of language* (Midland Book edition of 1962 of his *Linguistic Science in the Nineteenth Century*) 290, 336.

analysis. But a case has been made for a one-vowel system, and in order to refute it one should surely indicate in what respects this analysis fails to account for the data in a maximally exhaustive, economical, or consistent manner²⁶. The only serious review of *Kuipers'* work²⁷ is on the whole complimentary but it does point out certain doubtful features of the analysis, especially as concerns the replacement of *a* as a vocalic phoneme by the consonantal feature of openness (348-9); it also notices that *Kuipers'* phonological decisions are very largely based on morphological considerations which surely should have been justified by *Kuipers*, *Haugen* also echoes *Pittman's* doubts about the removal of *a*²⁸, as does *Pulleyblank*²⁹. But all these, however slightly critical, comments merely affect the ultimate consequences of *Kuipers'* whole trend of thought, they never question the very starting point from which all subsequent conclusions flow. In view of the importance of the question I must point out certain initial difficulties which obtrude themselves on any careful reader of *Kuipers'* work, even if he is not a Caucasian specialist.

The first step in the new analysis of Kabardian is, we have seen, the rejection of *Trubetzkoy's* linear system, in place of which *Yakovlev's* earlier system of two short vowels (*ə*, *a*) and one long vowel (*ā*) is reinstated. The next step is the reduction of *ā* to *a* by interpreting it as *ha* in syllable-initial position, but as *ah* in other positions. All the 'commentators' I have seen accept this step without a murmur, and yet it should have called for the closest scrutiny both on account of the obvious strangeness of the analysis of the same unit *ā* as being in one position the reverse of the same sequence in another position³⁰, and on account of the crucial importance of the phoneme *h*. Considering the prominence given in *Kuipers'* analysis to this phoneme, one can only feel disappointed at the perfunctoriness with which it is 'established'.

As is admitted by *Kuipers*, a phoneme *h* does not appear in *Yakovlev's* list³¹. 'It must be included in the list of phonemes for those dialects where the plural suffix is pronounced *-ha* (!) (the other dialects having *-x'e*, phonemically *-x'a*) and where there are,

²⁶ *Allen*, *Lingua* 13, 1964, 115.

²⁷ *R.S. Pittman*, *Lg.* 39, 1963, 346-350.

²⁸ *Haugen*, *Lg.* 40, 1964, 263.

²⁹ *Pulleyblank*, *Word* 21, 1965, 93.

³⁰ As if one said that *ē* was *He* initially but *eH* elsewhere.

³¹ *Kuipers*, *o.c.*, 21.

as a result, such oppositions as *g'enəd'āx'er*, phonemically *g'anad'āx'ar* 'the beautiful shirt' versus *g'enəd'āhar*, phonemically *g'anad'āhar* 'the sewn shirts'. Thus a phoneme is set up on the basis of a suffix alone – again a procedure which would have called for some justification, for, on the face of it, *-ha* can only be regarded as a variant of *-x'a*, since the single pair quoted as demonstrating a phonemic opposition can hardly be accepted as conclusive evidence. *Kuipers* quotes *Yakovlev's* statement that 'the pronunciation *-ha* is a peculiarity of the speakers of Little Kabarda' but counters by saying: 'It must be more widespread, however, as several of my informants who come from other regions use it. Both my main informants pronounce *-ha*. The West Circassian dialects all have *-x'a*³²'. This does not settle the issue.

And yet it is this unsatisfactorily established phoneme which is exploited for ever wider uses. First, a syllable-initial *ā* is interpreted as *ha* because (1) 'in this position it can be accompanied by a slight glottal friction, a variant which we shall write *hā*³³, (2) if *ā* is interpreted as *ha*, 'the defectiveness in the distribution of the phoneme *h* is reduced, and all Kabardian syllables uniformly have a consonantal initial'³⁴. If the phonemic status of *h* were established in the first place, one might admit its extension as legitimate; as it is, the operation looks very much like a sleight-of-hand. Furthermore, it disrupts certain connections which would otherwise seem self-evident. For, although it is customary to speak of Kabardian as having three vowels only, the fact is that, phonetically at any rate, there are also the vowels *ī ē ū ō*. This being the case, if *Trubetzkoy's* maximally open vowel was defined as *ā*, it would have been the most natural procedure to link this with the other vowels, thereby obtaining the classical shape in the long vowels at least:

$$\begin{array}{ccccc} & i & & & u \\ & \bar{e} & & & \bar{o} \\ & & \bar{a} & & \end{array}$$

For reasons which he nowhere states explicitly, *Kuipers* interprets phonetic *ī ē ū ō* as being phonemic *aj aj aw aw*³⁵. But even if, e.g., *ē* were merely the preconsonantal shape alternating with *aj*

³² *Kuipers*, *o.c.*, 21*. On the territory of Little Kabarda see p.8.

³³ *Kuipers*, *o.c.*, 24. Note also fn.9.

³⁴ *Kuipers*, *o.c.*, 33.

³⁵ *Kuipers*, *o.c.*, 23, 34.

before a vowel, this would be no justification for the proposed phonemic analysis, just as one would not interpret Skt. *ē* as phonemic *ay* because it alternates with *ay* in, e. g., *dhenu-*/*dhayati*. And it is interesting to learn³⁶ that in his latest work, of 1948, *Yakovlev* did in fact operate with five long vowel phonemes.

One of the most curious aspects of *Kuipers'* work is that no attempt is made to establish the phonemic inventory of the language he deals with. That is taken over from *Yakovlev*, although he subsequently disagrees with him on several points, and *Yakovlev* also changed his mind on different matters in the course of his career. Of obvious importance, from our point of view, would have been to see how the curious system of short vowels was arrived at. At present, we are only told³⁷ that there are two phonemes which, however, can have the most varied realizations, the higher vowel, e. g., appearing as *i ē ü u*, etc. Far from a case having been made out for a one-vowel system of Kabardian, one has increasing suspicions that even the two short vowels may not represent the full complement. One can only hope that the phonological atlas of the world suggested (or planned?) by *Jakobson*³⁸ will produce a more satisfactory picture.

The second language quoted in this context is *Abaza*, closely related to, and often considered a dialect of *Abkhaz*, like *Adyghe* a member of the North-West Caucasian, or, according to *Deeters'* classification, of the West Caucasian group³⁹. In his first study⁴⁰, *W. S. Allen* found that the language had two vowel phonemes, an open and a close vowel (symbolized by *a* and *ə*). But this statement is valid for main-stressed syllables only. In other positions the presence or absence of close articulations is 'determined by their consonantal environment, so that they may be considered simply as vocalic transitions between two consonantal articulations'. Therefore, if the conditions for such transitions can be found, there is no need for setting up a close vowel phoneme in such positions, the close articulation becomes prosodic ('anaptyctic'), non-phonemic. Although the conditions were 'highly complex', and no 'complete statement of transitional conditions' had yet been for-

³⁶ *Kuipers*, o.c., 397.

³⁷ *Kuipers*, o.c., 22f.

³⁸ At: *Universals of Language* 217.

³⁹ See *Dumézil*, at: *Les langues du monde* 242; *Deeters*, o.c., 9; *Klimov*, o.c., 15.

⁴⁰ *W. S. Allen*, *Structure and system in the Abaza verbal complex* (TPS 1956, 127-176), 141f.

mulated, *Allen* regarded as established that the *Abaza* vowel-system had two terms in stressed, and one term in unstressed syllables. He registered, however, as an exception to the statement about non-main-stressed syllables, that in certain cases the close articulation was 'not necessarily predictable' (143), i. e. it was phonological, so that in such cases the two-term opposition applied even outside the main-stressed syllables; but 'such vowels always carry a secondary stress'⁴¹.

At this point, it is difficult to see how the *Abaza* vowel-system could be compared with the current one-vowel IE system. One can therefore only regard as meaningless the statement that: 'The reduction of the IE vowel-system to a single term recalls the *Abaza* systems of two terms in stressed and one term in unstressed syllables' (172). There is simply nothing to compare between two such systems. However, in his intervention at the 8th Congress mentioned above (fn. 18), *Allen* went a significant step further: 'if one were to include stress, like the consonant clusters, as an environment requiring such "anaptyxis" in the absence of the open vowel, the close vowel might be excluded even from the stressed-syllable system (an interpretation that seems to have been favoured by the late *A. N. Genko* in his excellent *Abazinskij Jazyk*); if this interpretation is accepted, *Abaza* in fact shows only a single vowel-unit'. What is here merely given as a possibility, becomes a certainty in the later paper 'On one-vowel systems' (s. fn. 19)⁴². After stating (117) the

⁴¹ Like *Kuipers*, *Allen* also removes phonetic *i ü* as possible vocalic phonemes by interpreting them (140) as *ay aw* on account of 'the requirements of grammatical congruence'; he is however more explicit than *Kuipers* in acknowledging (143) that 'grammatical considerations have already been introduced into the phonological statement', although he offers just as little justification for this methodological step. Cf., on the other side, *Wyatt's* vigorous statement (Lg. 40, 1964, 143): 'The theory - any phonological theory - must rest on phonemic, not morphemic, data.' - Since *Ubykh* has been mentioned above, it is worth noting that the latest analysis (by *Vogt*, see *Allen*, Lg. 40, 1964, 502) still comes up with two phonemes, as in *Abaza*. Moreover, there is a long */ā/*, and in addition */ō/* which cannot be interpreted as */aw/* since it contrasts with it.

⁴² One cannot but get the impression that, anxious to avoid a direct confrontation with *Jakobson*, *Allen* was only too glad to have my paper as an excuse for an indirect attack. Knowing his other work fairly well, I can but marvel at the pettiness of his carping criticism in this paper of even the smallest stylistic idiosyncrasy. But the reader might not realize that his tirade on *e* as the only IE vowel (115f.) is again only nominally directed at me. It just isn't good enough to quote *Burrow* or *Wyatt* in order to show that *e* is merely a conventional symbol. For those who wish to acquaint themselves with the current picture of IE will not turn to these authors but to *Benveniste's Origines* and *Lehmann's PIE Phonology*, and in these works *e* is given as the IE vowel with no qualifica-

'prima facie case for a system of two vowel-phonemes', *Allen* goes on to state that 'the sounds which form the *a*-class are all predictable from (i) the sequences of consonants in terms of number and type, and (ii) the incidence of stress (where absence of /a/ automatically implies *a*)... There is thus no case for setting up a phoneme /*a*/, and concludes (119) that 'a one-vowel system (/a/) is clearly established for Abaza'.

This conclusion shows how easy it is to fall victim to one's own terminology. For the analysis clearly shows that, even at the end of the process of reduction, Abaza is not left with one vowel but, as before, with two. The only difference is that, whereas at the beginning the analyst overtly stated that the two-way choice was between /a/ and /*a*/, at the end he replaced the latter by stressed zero. Or, to put it slightly differently, under (phonemic) stress the choice is between /a/ and /non-a/, and the latter is definitely not zero⁴³. This point is of particular importance when it comes to comparing the Abaza system with the IE. For in the IE system in question the choice is not between /e/, to retain this obnoxious convention, and /non-e/, that is another phoneme; under phonemic stress there is no choice at all in IE, the phoneme is /e/. In this sense, then, those Indo-Europeanists can be said to act consistently who for this IE system simply posit 'syllabicity'⁴⁴, and not a vowel phoneme. The fact of the matter is that Abaza and current IE cannot be compared: the relation of their vowel-phonemes is either 2 : 1, or 1 : 0.

So far then the alleged Caucasian evidence for one-vowel systems has either turned out to be non-existent or to be incommensurate with the IE system in question. The third and last example⁴⁵ usually quoted for our problem is Wishram, a NW American Indian language of the Chinook group⁴⁶. In my earlier work⁴⁷, I ignored Wishram 'which allegedly has one full vowel

tions as to its real phonetic nature (even at *Lehmann* 112), and it was against this (phonetically and phonemically) misleading picture that I was arguing. Perhaps next time *Allen* could make bold to lay his charges at the door of those who are his real targets.

⁴³ This was what I meant by saying (*Lingua* 13, 1964, 6 fn. 12) that the one-vowel system of Abaza can be achieved by the analyst only at the price of assigning the differences to other factors. *Allen's* chagrined protest at the analytical sleight-of-hand (*ibid.* 117) can be left to the reader's judgment.

⁴⁴ *Lehmann*, Proto-IE Phonology 112f.

⁴⁵ I stand corrected on Bella Coola which, as *Allen* rightly says (*Lingua* 13, 113), is acknowledged to have a vowel system of the basic triangle type.

⁴⁶ See: *Les langues du monde* 1042.

⁴⁷ *Lingua* 13, 1964, 7 fn. 16.

only, the other "vowel-like phonemes" being "structurally semi-vowels"'. *Allen* argues⁴⁸ that the Wishram system is strictly comparable since, like the current IE system, it has one full vowel, i. e. a vowel that is always a peak, and two semivowels (*i*, *u*). This is perfectly true, and this was precisely my reason for ignoring Wishram⁴⁹. For the question is tied up with the status of the semivowels *i/j*, *u/w*. It is customary, in IE linguistics and in general, to regard *i* and *j*, and *u* and *w* as pure functional variants, the difference depending on their position in the syllable. But the question is whether this interpretation is really tenable. In his important paper⁵⁰ 'A propos de la question des semi-voyelles' *Straka* argues quite generally that semivowels cannot be admitted as a category, they are simply fricatives like *v* *z* *ʒ*, etc. (311) Functionally, after the Hindu grammarians, they are often classed as intermediate sounds, but *i u* and *j w* are different sounds, while *r l m n* and sonant *r l m n* are the same even when the energy input is varied so that they could truly be called semivowels (313-6)⁵¹. *Malmberg* also finds⁵² that 'the definition of the semivowels as structural vowels leads to serious difficulties'. In these circumstances it seems wisest not to try to reduce an actually existing system *i-a-u* to the single *a* on the assumption that *i* and *u* can be interpreted as variants of *y* and *w*.

The upshot of this critical examination would seem to be that so far typological studies have failed to turn up the sort of evidence which could be regarded as definitely proving that the current picture of IE vocalism is not out of this world. This means that a one-vowel system cannot be countenanced for *any* period of IE. It is useless to say that IE, to be sure, had a complex vocalism, but Proto-IE had a one-vowel system⁵³. But, as we have said already, even if typological studies failed us, we should still be bound in

⁴⁸ *Lingua* 13, 1964, 112-113.

⁴⁹ And not, as *Allen* 'deduces', that such a system was incredible on a priori grounds.

⁵⁰ *Straka*, *Zeitschrift für Phonetik* 17, 1964, 301-323.

⁵¹ Cf. also *v. Essen*, *Allgemeine und angewandte Phonetik*, 1966⁴, 96. It is interesting in this context that, according to *Collinge* (*Archivum Linguisticum* 8, 1956, 122f.): 'The evil effects of a combination of pattern-mania and theories of likeness of sound can be seen most notably in the supposed behaviour of the IE semivowels... The three groups of semivowels [*i u*, *r l*, *m n*] are far from having the same pattern of realisation: that of *i*, *u* is quite distinct, and although those of *r*, *l* and *m*, *n* are closer they are not congruent.' This point is also made by *Kurylowicz*, *Apophonie* 393.

⁵² *Malmberg*, *Structural linguistics and human communication*, 1963, 73¹.

⁵³ Strangely enough, *Allen* failed to notice that my criticism also implied the stage he calls pre-IE (b.c., 123f.). And it is quite gratuitous to label such a view ethnocentric (122). Name calling does not seem a very strong argument.

duty to observe the data of reconstruction which are also incompatible with the alleged one-vowel state.

This point acquires particular importance in connection with a recent attempt to interpret certain phenomena of IE vocalism in a novel fashion. In his interesting paper on 'The IE vowel system and the qualitative ablaut'⁵⁴, *E. G. Pulleyblank*, the Cambridge Sinologist, argues that there is no reason for the customary reconstruction of *a* and *o* for IE, which are then assumed in any case to have collapsed in a number of languages (Germanic, Baltic, Slavic, Hittite, Indo-Iranian) in a single vowel, in the majority of these languages in *a* (89). He assumes that there was only one vowel, *a* (not *o*, as assumed by *Kuryłowicz*⁵⁵), and continues: 'It is easy to suppose that in those languages which distinguish *a* and *o*, an original *a* has been displaced to *o* to make way for a new *a* of laryngeal origin, while in other languages the laryngeals were not responsible for introducing such a vocalic distinction'. We are not concerned here with his further suggestion that traditional IE *e/o* should be replaced by *a/a*, and that in this way the IE qualitative ablaut receives an illuminating solution from Kabardian where the same opposition is, according to *Kuipers*, accompanied by a semantic opposition between extrovert and introvert (91 f., esp. 95 f.). I cannot say that I found the application of this opposition to various IE categories very clear. If the definition for Kabardian [95: 'In all these cases a zero-form pointing outward (a) in space, (b) to a grammatical object, (c) to another closely connected word in the syntagm, is opposed to an *a*-form that does not'] is taken seriously, it is difficult to see any correlates in the IE categories of *e/o*-ablaut. To say that the contrast between *λέγω* : *λόγος* is a 'contrast between the active, directed notion expressed by the verb and the static, undirected notion expressed by the noun' (96) seems to be taking matters a long way from the Kabardian relations. Particularly lacking in cogency are the suggestions (98) that the alternation *e/o* in the thematic vowel of the verb – where the appearance of *o* is manifestly conditioned by the following nasal – should be interpreted as an extrovert-introvert contrast (: 'The first person, which always has the open-vowel form [i. e. *a* = IE *o*], can clearly be considered to be introvert in contrast to the second and third persons. The one obvious difficulty with this theory is

⁵⁴ Word 21, 1965, 86–101.

⁵⁵ *L'apophonie en indo-européen*, 1956, 166.

that the third person plural also has *o*... But these forms...'), and the tentative suggestion about the *o*-grade in the optative of the thematic conjugation that 'an introvert form is appropriate because the optative is used to indicate that the action denoted by the verb is regarded as virtual or imagined (internalized) from the point of view of the speaker'.

But, as I have said, our main concern here is not with the new explanation of the qualitative ablaut⁵⁶ but the statement that IE had only the vowel *a*, and not *a* and *o*. According to *Pulleyblank* there is no reason for assuming the collapse in one phoneme of an earlier pair in those languages which historically show only one vowel. He examines the evidence, but only partly. He is thorough in his review of the evidence for a Germanic, or Pre-Germanic, distinction of *a/o* and *ā/ō*, although his rejection of the traditional view that *w* (even the labialization of the labiovelars) is lost before original *o* only, not before *ā*, seems to me rather hasty. But he does not take into account that the old opposition *ā/ō* is generally thought to survive in Lithuanian in the form *ō/uo*, and this would seem to be decisive⁵⁷. Conversely, the evidence of the Southern languages for the distinction of *a* and *o* is not so easy to get rid of as *Pulleyblank* would have us believe.

Returning now to the help that present-day typological studies can give us in controlling our reconstructions, I should like to make a further point. As is known, the trend of the last forty years has been to reduce not only the IE vocalism but also IE consonantism. There are of course some items in the phoneme-inventory which are unshakable: *s*, *l*, *r*, *m*, *n*. But in the stop subsystem, the previously favoured four orders (on the model of Skt. *p ph b bh*, etc.) have been reduced to three (*p b bh*); moreover, the earlier assumed three dorsal series have been replaced by two. Thus the consonantal system has been reduced to the following set⁵⁸:

p	t	k	k ^w		m	n
b	d	g	g ^w	s	l	r
bh	dh	gh	g ^w h		w	y,

⁵⁶ But it may be noted that *Pulleyblank* seems unaware of *Matczak's* discussion (*Lingua* 9, 1960, 277–287).

⁵⁷ This is of course referred to in the chapter of *Meillet's* *Dialectes* which *Pulleyblank* quotes, p. 90.

⁵⁸ See *Lehmann, Proto-IE Phonology* 99. Cf. also *Hammerich, PBB* (Tübingen) 77, 1955, 7f.

that is 19 consonants all told. Those who would regard the aspirated voiced stops as diphonemic clusters can further reduce this number by three by setting up a phonemic aspiration. On the other hand, there have been attempts to increase this inventory, or at least re-introduce certain items of the old inventory. Thus *Benveniste* has revived, in a slightly different form, the Brugmannian interdental spirants⁵⁹, and this has been considered a step in the right direction⁶⁰. This would add three more phonemes. I personally do not believe in this set, and I am not alone in rejecting it⁶¹. But the most notable expansion has of course occurred in the laryngeal set which has grown to the impressive number of six⁶², eight⁶³, and even ten⁶⁴. Thus we obtain the following figures:

• stops	12
s, y w, m n, l r:	7
(? 'dorsal affricates')	3)
laryngeals:	1, 2, 3, 4, 6, or 8, or 10

The maximum figure for the IE consonantism is therefore 29, or, if we add the very unlikely 'dorsal affricates' and the alveolar affricate, 33. Against this stands the solitary vowel *e* (or *ä*, or *a*). The question arises whether this IE phoneme inventory can be regarded as typologically realistic, especially the balance between vocalism and consonantism.

To take first some well-known examples. We know that some languages make do with a very small inventory. Thus Hawai has 5

⁵⁹ BSL 38, 1937, 139–147. Cf. Kurylowicz, Apophonie 364f., Proceedings of the 9th Congress, 1964, 13, 36; *Martinet*, Word 9, 1953, 264f. = *Économie* 230f.; *Machek*, *Symbolae Kurylowicz*, 1965, 192f.

⁶⁰ Benveniste, BSL 50, 1955, 38; Hittite et indo-européen, 1962, 8, adding an IE affricate /c/.

⁶¹ See *Durante*, *Ricerche Linguistiche* 1, 1950, 234–249; *Lehmann*, Proto-IE Phonology 99f.; *Burrow*, The Sanskrit Language, 1955, 81; JAOS 79, 1959, 85f. 255f.; *Merlingen*, *Kretschmer Gedenkschrift* II, 1957, 49–61; *Sprache* 8, 1962, 74–6; *Zeitschrift für Phonetik* 13, 1962, 167f.; *Ivanov*, *Vestnik Moskovskogo Universiteta* 2, 1957, 46; *Pisani*, AGI 46, 1961, 27f.; Szemerényi, in: II. Fachtagung für idg. und allgemeine Sprachwissenschaft, Innsbruck 1962, 180f.; *Risch*, IF 69, 1964, 78; *Hamp*, in: Evidence for Laryngeals, 1965, 140f., esp. fn. 40, and 227 with fn. 4; note *Polomé*, *ibid.* 20 fn. 73. Both views are favoured by *Borgström*, NTS 16, 1952, 141.

⁶² *Puhvel*, Lg. 35, 1959, 648; Evidence for Laryngeals, 1965, 89. 92 (at least six).

⁶³ *Puhvel*, Evidence for Laryngeals, 1st ed., Austin 1960, 171.

⁶⁴ *Martinet*, Proceedings of the 8th Congress, 1958, 144; cf. *Phonetica* 1, 1957, 18. These laryngeals are fricatives (Proceedings 28).

vowels (i e a o u) and 8 consonants (p k m n w j h²)⁶⁵. Maori has the same 5 vowels, but 10 consonants (p t k m n' n' r w wh h)⁶⁶. At the other end of the scale, we find the NW Caucasian languages: Ubykh reportedly has 84 phonemes – a world record – of which 4 would be vowels; the Loov dialect of Abaza has 76 consonantal phonemes and 2 vowels, the Tapanta dialect 78 consonantal phonemes according to one researcher, but another has established no more than 64⁶⁷. In view of variations like the one mentioned last, one can sympathize with *Hockett's* scepticism about the figures from the Caucasus⁶⁸: 'if we limit ourselves to absolutely dependable reports, the upper limit is about 45, in Chipewyan', an Amerindian language of the Northern branch of Athapaskan, of which 6 are vowels⁶⁹.

On the whole it would seem that a minimum inventory requires a fairly high number of vowels, while a maximum inventory can do with a comparatively infinitesimal number of vowels. For our purposes it would be of obvious importance to know whether there is any set correlation between the two domains. Unfortunately there are no complete statistics for all the languages of the world. But *Hockett* has computed the ratio of the number of vowel phonemes to the total number of segmental phonemes for just under 70 languages⁷⁰, and his results are interesting, although we have to bear in mind that the principles of division and computation may not be quite the same as for our current IE. Languages with the fewest segmental phonemes tend to have a middling to high percentage of vowels. Those with intermediate numbers of segmental phonemes show greater variation in the vowel percentage, but average a rather higher ratio than the first group. Languages with very large numbers of segmental phonemes have the lowest vowel ratios. To give some absolute ratios: Finnish, with 8 vowels out of 21 phonemes, has the highest known ratio, just under 40% (0.38); Bella Coola, with 3 vowels out of 36 phonemes, has the

⁶⁵ *Hockett*, A course in modern linguistics, 1958, 93.

⁶⁶ Cf. *W. L. Williams* – *H. W. Williams*, First Lessons in Maori, 10th ed. revised by *W. W. Bird*, London–Melbourne–Sydney 1940, 5, modified after *Les langues du monde* 668.

⁶⁷ See for these data *Allen*, Lg. 40, 1964, 501.

⁶⁸ *Hockett*, Course 93; cf. A manual of phonology, 1955, 138.

⁶⁹ *Hockett*, Manual 86. For further details see *Li Fang-Kuei*, Linguistic structures of native America, Johnson Reprint 1965, 398f.

⁷⁰ See *Hockett*, Manual 138, with the graph on p. 139, and Course 95.

lowest, about 8% (0.083). But Bella Coola has the lowest ratio only if we dismiss the NW Caucasian languages as not having been reliably reported. If we take into account Ubykh, with 4 vowels out of 84 phonemes, we find a ratio of just under 5% (0.047). Abaza, if credited with 2 vowels out of 66 phonemes, gives a ratio of 3%; if we accept the inventory of 80, with 2 vowels, the ratio sinks to 2½%.

For current IE consonantism we get, dependent on the analysis, a minimum of 20 phonemes, and a maximum of 29 or 33 phonemes. If we add the single vowel to the inventory, the corresponding ratios of 'vowels to all phonemes' will be 5% for the minimum, 3.33% and 2.94% respectively for the maximum. It is interesting to note that the minimum system (with one laryngeal only!) gives a ratio which is almost identical with that of Ubykh, that is, contrary to aprioristic statements⁷¹, would seem to be viable⁷². But what stands out most clearly is that both the maximum and the minimum inventory yield ratios which are of the unusual type: the lowest normal ratio is 8%, our 5%, 3.33% and 2.94% can only be matched from the Caucasus. The least one can infer from this is that current IE with its one-vowel system would be very unusual, not to say abnormal (= deviating from the norm).

To sum up this rather long discussion. The current picture of the IE phonemic inventory with one vowel is at variance with the primary facts of reconstruction. It is also contradicted by our worldwide typological experience: there is no language in the world which would show a one-vowel system in any comparable sense. This observation is corroborated by the fact that the ratio of vowels to the total inventory would be of an unusual type.

We must therefore conclude that such a picture is quite unrealistic and is to be rejected – and not only for a single proto-period of IE, but for any and all proto-periods. We must restore to all such periods the complement indicated by unbiased, non-reductionist reconstruction. One of the most urgent tasks is therefore a re-examination of the status of the so-called laryngeals.

⁷¹ *Martinet*, *Economie* 233f.: the reductions 'nous amènent à un système si maigre avec ses 21 consonnes et sa voyelle unique qu'aucune langue ne pourrait fonctionner dans ces conditions'.

⁷² We must of course ignore here the probable consequences of such a stock as to syllabic and morpheme structure.

II.

In our investigations we have so far tried to exploit for the purposes of reconstruction one particular aspect of typological studies: the *statistical universals*. But just as important, and promising, are in this field the *implicational universals* which *Roman Jakobson* and some of his followers are discovering in increasing numbers. Implicational rules establish certain obligatory connections in the phonological and morphological structure of languages, probably also in syntax, so that the presence in a language of one property entails, or on the contrary rules out, the presence of another property⁷³.

The importance for the reconstruction of IE of such implicational universals can be shown by a simple example. The current picture operates with three orders of stops. At each place of articulation, three modes of articulation are assumed: voiceless unaspirated, voiced unaspirated, and voiced aspirated, e. g. /t d dh/. 'To my knowledge – says *Jakobson* in his report on typology⁷⁴ – no language adds to the pair /t/-/d/ a voiced aspirate /d^h/ without having its voiceless counterpart /t^h/, while /t/, /d/, and /t^h/ frequently occur without the comparatively rare /d^h/, and such a stratification is easily explainable (cf. *Jakobson-Halle*); therefore theories operating with the three phonemes /t/-/d/-/d^h/ in Proto-IE must reconsider the question of their phonemic essence.'

To avoid misunderstandings, this is a statistical universal, on a par with our previous universal that there is no language with one vowel only. It should also be noted that it had been formulated before *Jakobson*. Thus, e. g., *Martinet* stated: 'Une série du type b^h, d^h, g^h ne paraît attestée que dans les langues où existe aussi une série de sourdes aspirées p^h, t^h, k^h. Ceci se comprend bien... Mais on voit mal comment b^h, d^h, g^h pourraient être les seules aspirées d'un système autrement qu'à titre transitoire. Aujourd'hui, où l'on tend à dénier à l'indo-européen commun une série de sourdes aspirées, il convient de reposer le problème de la marque de la série dite des sonores aspirées⁷⁵.'

⁷³ See *Jakobson*, *Selected Writings* I 526f., as also 327, 482f., 654; cf. also: *Universals of Language* 210f. Here too the gathering of data must be punctilious. The statement in the last work (216) that the genitive of negation does not exist in Ancient Greek is untrue if Homeric Greek is included, s. *Schwyzler-Debrunner*, *Griech. Gram.* II 102.

⁷⁴ *Selected Writings* I 528.

⁷⁵ *Economie* 115. Cf. also 136.

The inference is clear: we must either return to the previous (Brugmannian) system of four orders, e. g. /t d th dh/ which makes phonemic sense *sub specie universalium*, or else we must reinterpret the phonological relations at present symbolized by /t d dh/. What we cannot do is to go on using these last symbols as if we really meant voiced aspirate stops when we used the symbol /dh/.⁷⁶

But of far greater importance, and, as I think, of much more wide-reaching consequence, is Jakobson's implicational universal concerning these phonemes⁷⁷: 'views, prior or opposed to the laryngeal theory, which assign no /h/ to IE, disagree with typological experience: as a rule, languages possessing the pairs voiced-voiceless, aspirate-non-aspirate, have also a phoneme /h/'.⁷⁸ Strangely enough, the importance of this implicational law has so far escaped the attention of Indo-Europeanists. And yet it forces us to pose a fundamental question: Since IE admittedly has the pairs in question, where is the phoneme /h/ which is necessarily entailed by them? Jakobson makes it clear that the disappearance of /h/ has corresponding repercussions on the aspirate stops: they disappear in that they merge with non-aspirate stops (type dh > d), or develop into other sounds (type th > þ), etc. But while they exist, their existence is, so to speak, tied up with the existence of an independent phoneme /h/.

Against this background, the question just posed seems to allow of one answer only: IE which had aspirated stops, also had the phoneme /h/. It is the phoneme that, partially at any rate, survives in Hittite. If the Hittite phoneme was rightly identified with Saussure's coefficients or the later laryngeals, then these turn

⁷⁶ This was already stated in my Trends and Tasks 9f. Kurylowicz has repeatedly connected the problem with Bartholomae's law (s. Etudes indo-européennes I, 1935, 50f.; L'apophonie en indo-européen, 1956, 379f.; II. Fachtagung, 1962, 107f.; Proceedings of the 9th Congress, 1964, 13), and insisted that the so-called voiced aspirates did not have phonemic voice before the operation of Bartholomae's law. If there was only one aspirate set, then its non-phonemic character would be clear in any case. But Jakobson's formula seems to exclude such a solution. On Bartholomae's law see now also Gray, BSOAS 27, 1964, 615-9, and on the general problem Hoenigswald, JAOS 85, 1965, 59-60. Of interest is Kurylowicz's allusion (Proceedings 13) - if I do not misinterpret his words - that the voiced aspirates may be compared to the Semitic emphatics.

⁷⁷ Selected Writings I 528.

⁷⁸ Hockett (at: Universals of Language 20) says: 'Mandarin Chinese is almost an exception, in that the nearest thing to an /h/ is normally a dorso-velar spirant', just as he has mentioned some exceptions to other generalizations of Jakobson. But he continues: 'Yet these generalizations seem far too widely borne out to merely be thrown into the scrap-heap by virtue of a handful of exceptions.'

out to have been simply the glottal spirant, and not the currently assumed 'phonetically indefinable', or pharyngeal, or simply 'algebraic' entities.

This conclusion has several consequences of the greatest importance for the reconstruction of IE.

(1) As we have seen, there is no justification for reducing the whole IE vocalism to the single timbre *e*; *a e o (i u)* must be reinstated. That being the case, we can give up chasing after an ever growing number of laryngeals. The basis of the young Saussure's thought, the parallelism between, say, *dhē-*/*dhā-*, etc., and *ei-*/*i-*, etc., is just as clear if instead of *eH₁*, *eH₂*, *eH₃*, we posit *eh*, *ah*, *oh*, and as their single nil-grade form *h*. This conclusion agrees with the findings of a number of recent investigations into the laryngeals, which can find no more than one laryngeal⁷⁹, and with the growing recognition of the fact that Greek with its triple reflex of the nil-grade is not original⁸⁰. How *h* led to Brugmann's *ə*, and then generally to *a* except for Aryan where it gave *i* is a secondary question; but since *h* is a consonant, the most likely solution seems that *h* evolved an anaptyctic vowel before which it disappeared in due course⁸¹.

Much more important is the following point. As we have mentioned already, Kurylowicz is increasingly inclined to admit the Brugmannian varieties of IE vocalism, in particular *e i u* but also the long vowels *ē ō ī ū* as original, not secondarily developed phonemes; only *a* and *ā* are still firmly excluded⁸². But this admission is not based on evidence, only on general considerations. Yet

⁷⁹ See Vaillant, Grammaire comparée des langues slaves I, 1950, 241f.; Zgusta, La théorie laryngale, Ar Or 19, 1951, 428-472, and his comments at Ar Or 33, 1965, 640; Scardigli, Osservazioni sulla teoria delle laringali (Atti e memorie dell'Accademia Toscana La Colombaria 22, 1957, 75-116) 94, 116; Ivanov, Problema laringal'nyx v svete dannyx drevnix indoevropskix jazykov Maloj Azii (Vestnik Moskovskogo Universiteta 2, 1957, 23-46) 44 (: IE had one laryngeal, and, in addition to *e*, the vowels *a* and *o*, cf. Scardigli 116). Gamkrelidze (at: Problemy sravnitel'noj grammatiki i. jazykov, 1964, 49) assumes that an early triad had already collapsed in a single laryngeal in IE, and IE had *eH* *aH* *oH* and *He* *Ha* *Ho*.

⁸⁰ See Kurylowicz, Apophonie 201f.

⁸¹ This was of course Kurylowicz's idea from the start. Cf. also, for a vocalic *H*, Zgusta, Ar Or 19, 1951, 472; and recently Gamkrelidze, o.c. (s. fn. 79) 47, 49. On the theoretical point see also Belardi, Ricerche Linguistiche 4, 1958, 190, and for an interesting parallel in the phonemic analysis of Modern English, Hall, Introductory Linguistics, 1964, 97f. - See also the text further on.

⁸² See Apophonie 392-393 (slightly at variance with 106¹⁰); II. Fachtagung 112-114. Cf. also Proceedings of the 9th Congress 28.

proof positive for part of this thesis has been available for many years – if only it had not been explained away.

The Hittite lexicon offers a number of correspondences to words which in the 'old' languages show a long vowel. Of such equations we may mention:

<i>lahha-</i>	'campaign'	: Gk. <i>λαός</i> 'people, army'
<i>pahs-</i>	'protect'	: Skt. <i>pā-</i> , Lat. <i>pāscō</i>
<i>newah-</i>	'renew'	: Lat. <i>novā-re</i>
<i>nahmi</i>	'I fear'	: OIrish <i>nār</i> 'bashful'
<i>mehur</i>	'time'	: Goth. <i>mēl</i> 'time', Lat. <i>mē-tior</i> ⁸³ .

It seems clear that in such cases the Hittite *vowel + h* is to be equated with the long vowel found elsewhere, i. e. the Hittite facts prove that such long vowels of the other languages derive from an earlier sequence *short vowel + h*.

But there are just as many cases, if not more, in which a long vowel of the other languages is not reflected by *vowel + h* in Hittite. Examples:

<i>esa(ri)</i>	'sits'	: Skt. <i>ās-te</i> , Gk. <i>ἥσ-ται</i>
<i>pas-</i>	'swallow'	: Lat. <i>pō-tāre</i>
<i>iyattari</i>	'he marches'	: Skt. <i>yā-</i> 'go'
<i>tayezzi</i>	'he steals'	: Slavic <i>tatb</i> 'thief'
<i>hassi</i> (dat.)	'hearth'	: Lat. <i>āra</i> , Osc. <i>aasas</i>
<i>tatti</i>	'thou takest'	: Lat. <i>dō</i> , Skt. <i>ā-dā-</i> 'take'
<i>ais</i> , Luw. <i>assa-</i>	'mouth'	: Lat. <i>ōs</i> .

These are usually interpreted as showing a Hittite defect. Since the researcher is convinced that (1) all IE long vowels represent earlier sequences of short vowel + laryngeal, (2) that such sequences are normally represented by *vowel + h* in Hittite, he is compelled to regard Hittite cases in which *h* does not appear as having lost it. The practical futility of such attempts is vividly shown when it comes to formulating the conditions under which such losses allegedly occurred⁸⁴. But there is no reason in pure theory either why one should accept the initial doctrine. Surely,

⁸³ The old, and now antiquated, comparison of Hitt. *mahla-* with Lat. *mālum* 'apple' should not be mentioned in this context (*Zgusta*, Ar Or 33, 1965, 640), especially if it is acknowledged that it means 'vine, Weinstock'.

⁸⁴ See, e.g., *Hendriksen*, *Untersuchungen über die Bedeutung des Hethitischen für die Laryngalthorie*, 1941; *Crossland*, TPS 1951, 109f.

the only real evidence that we possess is afforded by the Hittite evidence with *h*. In instances where Hittite shows no *h*, there is a *prima facie* case for assuming an original long vowel for IE. This need not mean that an original *h* could not have been lost under definite circumstances in Hittite. What is really needed is a renewed, and unbiassed, study of all the available Hittite evidence – with no attempt to force it into the strait-jacket of preconceived theories about IE ablaut or root-structure.

It follows then that Hittite offers direct evidence for the co-existence in IE of original long vowels⁸⁵ and sequences of short vowel + *h* which in other languages, under certain circumstances, merged with the original long vowels.

One further advantage of the view here advanced is that, at long last, we get a better purchase for the understanding of the development of the nil-grade of long vowel roots. If only roots of the structure *CeH-* are assumed, their nil-grade (say, in *CH-tō-*), which generally appears in the later stages as *Catō-* or (in Aryan) as *Citō-* presents difficulties which are only papered over by assuming that *H* could become vocalic and so *H* gave *a* or *i*. Now if there existed genuine long vowel roots, e. g. *tā-* 'steal', their nil-grade naturally resulted in a weakened form, say **tə-*. It was this type which attracted the laryngeal type so that their nil-grade, *H*, became *ha*, later *ə*.

To sum up the results of this section in a slightly paradoxical form: *We do need a laryngeal h – not, however, primarily to account for the IE long vowels ā ē ō but, on the contrary, for the aspirated stops bh dh, etc.*

(2) It is also clear that there is no intrinsic reason why we should attempt to reduce all IE 'roots' to a single tri-phonemic pattern of the *CVC*-type, even if the majority of the monosyllabic roots should have exhibited this shape⁸⁶. On the contrary, it is clear

⁸⁵ I should mention just one, to my mind, cogent example. The present view would force us to interpret IE **māter-* 'mother' as representing **mahter-*, or, worse still, **meH₂ter-*. Surely *mah-* or *meH₂-* clashes with everything we know about this (nursery) word, see *Jakobson's* paper: Why 'mama' and 'papa'?, *Selected Writings I* 538-545.

⁸⁶ Note such lone dissenters as *Hendriksen*, *Untersuchungen* (s. fn. 84) 44; *Couveau*, *Antiquité Classique* 12, 1943, 106; *Messing*, *Harvard Studies in Classical Philology* 56-57, 1947, 198-9; *Crossland*, TPS 1951, 115¹; *Collinge*, *Archivum Linguisticum* 5, 1953, 84; *Zgusta*, Ar Or 19, 1951, 469-70 (: in cases like Hitt. *appa* there never was *H*: there is an IE *a* not due to ablaut or laryngeals; cf. *Wyatt*, Lg. 40, 1964, 149); *Cowgill*, Lg. 36, 1960, 498; *Evidence for Laryngeals*, 1960¹, 131 (toned down in the 1965 edition p. 166f.).

that such notions were due to a double influence from Semitic linguistics: (a) in Semitic all words begin with a consonant; (b) in Semitic the general root-shape is tri-radical. But of course neither feature is binding for IE; and even in Semitic, the older stratum of the lexicon is frequently biradical⁸⁷.

In these circumstances, it seems of no avail to be governed by a priori assumptions. We must once again return to the firm ground of empirical facts. Now Hittite exhibits several sets of facts which clash with the current assumption that there were no vocalic initials in IE, and that of the three laryngeals H_2 and H_3 appear in Hittite as *h*, and only H_1 is lost without a trace.

The current assumption seems borne out by a number of good equations such as:

(a) <i>hant-</i>	'front'	: Lat. <i>ante</i>
<i>harki-</i>	'white'	: Gk. ἄργυρος
<i>hassi</i>	'hearth'	: Lat. <i>āra</i>
<i>hap-(a)-</i>	'river'	: IE * <i>ap-</i> 'water, river'
(b) <i>hapin-</i>	'rich'	: Lat. <i>op-ulentus</i>
<i>hastai-</i>	'bone'	: Gk. ὀστέον
L. <i>hawi-</i>	'wether'	: Lat. <i>ovis</i>
<i>hara(n)-</i>	'eagle'	: Gk. ὄρνις, OHG <i>aro</i> 'Aar'
<i>hasduer</i>	'twigs'	: Gk. ὄζος, Germ. <i>Ast</i> .

Against these examples stand those in which an *a-* or *o-* of the other languages corresponds to a Hitt. *a-*, not *ha-*. Cf.:

<i>appa-</i>	'behind, after'	: Gk. ἀπό or ὀπί-
<i>ais</i>	'mouth'	: Lat. <i>ōs</i>
<i>arkuwai-</i>	'exculpate oneself'	: Lat. <i>arguo</i> ⁸⁸
<i>apa-</i>	'that'	: IE * <i>obho-</i>
<i>anna-</i>	'mother'	: IE * <i>an-</i>
L. <i>aku(wa)-</i>	'drink'	: Lat. <i>aqua</i> .

As is known, it was on account of such cases that Kurylowicz ventured, right from the start, to introduce a fourth laryngeal.

⁸⁷ Cf. An Introduction to the Comparative Grammar of the Semitic Languages (ed. S. Moscati), Wiesbaden 1964, 72f., and especially the statement (74): 'It is a more likely supposition that originally there existed roots with either two or three consonants... and that at a certain stage in the development ... the triconsonantal system prevailed.'

⁸⁸ Laroche, La prière hittite (Ecole Pratique des Hautes Etudes, V^e Section, Sciences Religieuses, Annuaire 72, 1965, 3-29), 13-20.

Those who content themselves with three, cannot, and usually do not bother to, offer any explanation. But a fourth laryngeal is also quite useless in itself, we would have to introduce at least one more. For, contrary to the general assumption, Hittite also has *he-* in initial position; if *e* is IE *e*, H_1 should have been lost before it, if *h* is H_2 or H_3 , the vowel should be *a*. Evidence:

<i>henkan-</i>	'fate, plague, death'	: OIr. <i>ēcen</i> 'necessity'
<i>henkzi</i>	'bows'	: Gk. ὄγκος
<i>hekur</i>	'boulder, rock'	: Gk. ὄκρις.

It should also be noted that *hara(n)-* 'eagle', mentioned above as showing *ha-* in agreement with Gk. ὄρνις, is also not without blemish: Greek verbal forms like ἔπειο suggest that the root was **er-* in which case only a root-form H_1er- is possible, with H_1or- as 'Abtönung'. In Hittite there is in that case no justification for *h-* on the current view.

From the material here presented the following facts can be seen:

(a) IE initial *a-* and *o-* often appear in Hittite with preceding *h-* but also without;

(b) IE initial *e-* mostly appears as *e-* in Hittite too, but there are undeniable instances of *he-*.

This 'contradictory' evidence admits of only one unforced interpretation: IE had in initial positions both *he-* *ha-* *ho-* and *e-* *a-* *o-*. In other words, the currently fashionable view that all words which in the 'old' IE languages have an initial vowel had lost an earlier laryngeal, is demonstrably false.

It also follows that the doctrine that all IE roots were 'triliteral', is false; beside such roots (e. g. *pet-* 'rush, fly', *hap-* 'water', etc.), there were also "biliteral" roots such as *ed-* 'eat', *es-* 'be', etc. The question can only be decided when there is Hittite evidence at our disposal.

(3) If the so-called *Mediae Aspiratae* presuppose the existence of a phoneme *h*, we can conversely say that they are combinations of unaspirated voiced stops with this phoneme. The question then arises whether such clusters should be regarded as *monophonemic* or *diphonemic*.

In recent years, it has often been held that *Mediae Aspiratae* can represent combinations of *Media* + *Laryngeal* but only when some discrepancy between various IE languages is to be explained

(e. g. Skt. *aham*: Lat. *ego*). There seems however no ground for a distinction of two kinds of Mediae Aspiratae on the diachronic plane.

As to the question: one phoneme or two – the answer seems fairly clear at the IE level. For IE we must acknowledge such word-forms as **prek-* **plāg-* **drem-*, etc., but also **bhrāter-* **dhreugh-*, etc., that is initial sequences of Tenuis/Media/Media Asp. + Liquid, not however, e. g., Tenuis + Spirant + Liquid (say **psrem-*). This would seem to decide the question: on distributional grounds a group *bhr-* or *dhr-* cannot be regarded as containing three phonemes, it consists of the two phonemes /*bh*/ or /*dh*/ + *r*.

At an earlier stage, however, with different syllabication, the Mediae Aspiratae were probably diphonemic.

(4) There is no intrinsic reason against the assumption that, beside the Mediae Aspiratae, there were also Tenuis Aspiratae. In fact, as we have seen, *Jakobson's* statistical universal speaks for their existence. That being the case, it seems pointless to try to eliminate the Tenuis Aspiratae where they are found, i. e. in Aryan. Instead, we should assume that the IE Tenuis Asp. survived in Aryan but were (mostly?) collapsed with other series elsewhere.

(5) So far we have seen no reason for assuming more than one laryngeal, namely the glottal spirant *h*. Theoretically, it might be possible to envisage variants of this phoneme, or even independent phonemes, say a triad /*h*/, /*h*¹/ and /*h*^w/ . The latter might, e. g., be identified with *Martinet's* labialized back laryngeal **A^w*. But so far the assumption of more than one laryngeal rests on no good evidence. Further research might bring a change⁸⁹.

It is time now to sum up our different findings. The most important, that is those diametrically opposed to the current view, are as follows:

(1) There is *only one laryngeal* which is not a mysterious indefinable entity, but simply the glottal fricative *h*.

(2) The current doctrine that Pre-IE had *only one vowel* is false. Pre-IE, like IE, had the full complement of the classical five-vowel triangle, *a e o i u*.

(3) Corresponding to these short vowels, the IE languages also have *phonemic long vowels*. In part, these are to be traced to

⁸⁹ I might mention here that the nature of Hittite *h*, probably a velar spirant, does not affect the question of its IE antecedent.

preconsonantal sequences of the *short vowels* + *h* (*ehC*, *ahC*, etc.), which, apart from Hittite, are nowhere preserved. In part, however, they represent original long vowels already in IE, and appear as such in all languages of the family, including Hittite.

(4) The current doctrine that the Pre-IE root was monosyllabic – may be true. But the concomitant thesis that all such monosyllabic roots had a central core, *e*, flanked on either side by one consonant (these including the laryngeals), is demonstrably false in both parts. The triliteral structure of such roots may be true of most of them but is certainly not universal. Quite a number had a vocalic initial, that is they were biliteral. What is more, besides *e*, *a* and *o* also appear as rootcores.

(5) Beside the generally recognized Mediae Aspiratae there were also Tenuis Aspiratae. The phonemic status of the former is therefore no longer in doubt.

As to the phonological system, the 'new look' will become clearest if it is placed side by side with the old one:

I									
Old ⁹¹					Pre-IE ⁹⁰				
p	t	k			p	t	k	(k ^w) ⁹²	
(b [?])	d	g			ph	th	kh	(k ^w h)	
b ^h	d ^h	g ^h			b	d	g	(g ^w)	
					bh	dh	gh	(g ^w h)	
y	w	l	r	m n	y		w		
					l	r	m n		
		s			s		h		
	h	x	γ	?	a	e	o	i	u
/ʌ/ (syllabicity)					ā	ē	ō	ī	ū
II									
IE					IE				
p	t	k	k ^w		p	t	k' ⁹³	k	k ^w
b	d	g	g ^w		p ^h	t ^h	k' ^h	k ^h	k ^w h

⁹⁰ The term Pre-IE is here used in the sense of 'period preceding IE and distinguished by certain features from IE'. IE means the linguistic stage which can be reconstructed from the data of the IE languages as their immediate antecedent.

⁹¹ For the 'old' view of Pre-IE and IE, I have taken as my guide *Lehmann's* PIE Phonology, pp. 112 and 99 respectively.

⁹² The bracketing should indicate that there are doubts about whether the labiovelars were phonemic at this stage, or simply clusters (*kw*, etc.).

⁹³ The so-called palatals are here regarded as phonemic; they do not appear in the Pre-IE set as they developed later from the velars.

b ^h	d ^h	g ^h	g ^{wh}				b	d	g'	g	g ^w
							b ^h	d ^h	g' ^h	g ^h	g ^{wh}
									y	w	
y	w	l	r	m	n			l	r	m	n
		s							s	h	
	h	x	γ	ʔ			a	e	o	i	u
e	a	o	ε				ā	ē	ō	ī	ū
ī	ē	ā	ō	ū							

(also the sequences
ah ch oh ih uh)⁹¹

The 'new look' cannot hope to impose itself in a single day. After all, the 'old look' had a pretty hard time gaining admittance. But the inner consistency of the 'new look', the fact that 'tout se tient', would seem to be an enviable recommendation which will eventually help it over the hurdles. It is clear, however, that this paper is merely a beginning which must be followed by a renewed investigation of the problems here reopened for discussion.

This first attempt to present an integrated and typologically acceptable view of the IE phonological system is offered to *Antonino Pagliaro*. Starting from one of our common interests, Iranian philology, he has made his way to ever wider and more general problems. It is hoped that he will find some pleasure in recognizing the same trend in this paper dedicated to him on an important occasion in his life.

Summary

In IE there is only one laryngeal, the glottal fricative *h*. The current doctrine that Pre-IE had only one vowel is false. Pre-IE, like IE, had the full complement of the classical five-vowel triangle *a e o i u*. Corresponding to these short vowels, the IE languages also have phonemic long vowels. The thesis that all monosyllabic roots had a central core, *e*, flanked on either side by one consonant, is false. The triliteral structure of such roots is certainly not universal. Besides *e*, *a* and *o* also appear as root-cores. Besides the generally recognized Mediae Aspiratae there were also Tenues Aspiratae. The phonemic status of the former is therefore no longer in doubt.

⁹¹ I ignore here the diphthongs whose phonemic status is disputed. Cf. *Lehmann*, Proto-IE Phonology 11f.

Das Indoeuropäische in neuer Sicht – Rekonstruktion und Typologie

Zusammenfassung

Im IE gibt es nur einen Laryngal, den Glottisreibelaut *h*. Die Ansicht, daß das Vor-IE nur einen Vokal besaß, ist falsch. Das Vor-IE hatte, wie das IE, den vollen Satz des klassischen Vokaldreiecks mit den fünf Vokalen *a e o i u*. Diesen kurzen Vokalen entsprachen in den IE-Sprachen auch phonemisch lange Vokale. Die These, daß alle einsilbigen Wurzeln im Kern ein *e* hatten, das beiderseits von einem Konsonanten umgeben war, ist falsch. Daß solche Wurzeln aus drei Phonemen bestehen, gilt sicher nicht allgemein. Neben *e* erscheinen auch *a* und *o* im Kern der Wurzeln. Neben den allgemein anerkannten Mediae aspiratae gab es auch Tenues aspiratae; der phonemische Status der ersteren ist deshalb nicht mehr zweifelhaft.

L'Indoeuropéen en perspective nouvelle -- Reconstruction et typologie

Résumé

En IE il n'y a qu'une laryngale, la fricative de glotte *h*. La doctrine que le Pré-IE avait seulement une voyelle est fautive. Le Pré-IE avait comme le IE la pleine série du triangle classique avec les cinq voyelles *a e o i u*. A ces voyelles courtes correspondaient dans les langues indo-européennes aussi des voyelles phonémiquement longues. La thèse que tous les radicaux monosyllabiques avaient au centre un *e* flanqué de chaque côté d'une seule consonne, est fautive. Que ces radicaux se composaient de trois lettres est une affirmation qui ne vaut certainement pas toujours. Avec *e* apparaissent *a* et *o* au centre des radicaux. A côté des «Mediae Aspiratae» généralement reconnues il y avait aussi des «Tenues Aspiratae»; pour cette raison le status phonémique des premières n'est plus longtemps douteux.

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Addenda

- P. 67: Against the separation of synchrony and diachrony see now also *Heller-Macris*: Parametric linguistics, p. 77f. (1967).
 P. 77: *Bernhard Shebeck*: The structure of Kabardian (*La Linguistique* 1: 113-119, 1965), also rejects *Kuipers*' analysis of \bar{a} as *ha* and *ah*, and regards /a/ as a voiced plain laryngeal, not a feature of openness. Cf. *Kuipers*' reply, *ibid.* 11: 133-136 (1966).
 P. 83: Cf. also *Pulleyblank*: *Lingua* 14: 231f., 237 (1965).
 P. 88 fn. 73: On universals see also *Greenberg*'s papers: Synchronic and diachronic universals in phonology (*Lg.* 42: 508-517, 1966) and Language Universals (in: *Current Trends in Linguistics* 3: 61-112, 1966). On implicational universals: *Stankiewicz*, at: *Current Trends* 3: 515, 518.
 P. 89 fn. 76: On Bartholomae's law see now also *Szemerényi*, *Sprache* 12: 205 (1967) with fn. 84.
 P. 92 fn. 86: To the references add *Collinge*, i.e. next note.
 P. 94: On root-structure, cf. *Collinge*, *Journal of Linguistics* 3: 161 (1967): I still see no need to convert a preference into a universal.

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